Fleet Advantage
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FLEET ADVANTAGE WHITEPAPER SERIES

THE FUTURE OF HEAVY-DUTY TRUCKS;
BUILDING A BRIDGE TO ALTERNATIVE ENERGIES FOR U.S. LONG HAUL TRANSPORTATION - THE BACKBONE OF OUR NATIONAL SUPPLY CHAIN

EXAMINING ALTERNATIVE ENERGIES AND TECHNOLOGIES FOR CLASS 8 VEHICLES

INTRODUCTION

Climate change is among today's most heated debates and social causes, prompting global corporations to re-write their business strategies to reduce and eventually meet a zero carbon emission footprint. Greenhouse Gas (GHG) emissions are at the heart of climate change discussions, with global economic activity producing CO2 levels estimated to be 50% over pre-industrialization levels[1].

Corporations and government leaders are facing tremendous pressure from key stakeholders, environmental groups, customers, and shareholders to find ways to reduce GHG output from their factories and supply chains. This is now reflected in that an estimated 90% of companies in the S&P 500[2] provide environmental, social, and governance (ESG) plans and reports to demonstrate how they will reach aggressive carbon-reduction goals.

Over the last few years, more corporations and business leaders have taken steps to initiate these ESG plans and goals. Still, more efforts are required since the SEC recently issued a proposed rule that would enhance and standardize the climate-related disclosures provided by public companies.

Under the proposal, a registrant will be required to adhere to GHG emissions disclosures within qualitative governance disclosures within their annual reports (e.g., Form 10-K). Aside from the adherence to GHG improvements, companies will need to document their emissions certifications for SEC filings.

This is critical because medium- and heavy-duty vehicles, including tractor-trailers, large pickups and vans, delivery trucks, buses, and garbage trucks, produce about 24% of transportation emissions[3].

One of these strategies involves replacing gas- and diesel-powered engines (ICE – internal combustion engines) with battery-electric, hydrogen fuel cell, or biofuel technology in cars, medium-duty vans, heavy-duty long-haul trucks, and "last mile" delivery vehicles. While the movement toward this technology has received glowing applause and headlines worldwide, its near-term application can only be based on the current path of technological gains.

This report will explore the realities of moving from diesel-powered engines to EV battery, hydrogen or other technologies for heavy-duty trucks and will illustrate how a natural bridge progression strategy will ultimately serve America's best interests in achieving the goal of sustainable global emissions reduction over an extended period of time.

IN THIS REPORT

This report will highlight today's facts about electric batteries and hydrogen fuel cells, and other alternative energies and addresses actionable strategies that help companies with transportation fleets achieve ESG goals, while bridging their plan to a future of alternative energy technology. The report will also address several critical areas, including:

- The economics of deploying EV technology today and their net benefit as compared to diesel ICE
- The logical approach – create a bridge to future energy alternatives
- Pros and Cons of today's alternate fuel technologies
- The benefits of clean diesel technology
- Innovative truck replacement programs
- The future of alternate fuel technology

THE REALITY OF TODAY'S EV BATTERY ACTIVITY

Heavy-duty trucks remain essential to keeping the global economy running, especially today, as raw materials shortages have severely strained worldwide supply chains and deliveries.

Trucks that move goods, medicines, technology products, and construction equipment have never been more critical to local, national, and international economies. Most heavy-duty trucks today, ranging from Class 5 (16,001 lbs.) to Class 8 (26,001 lbs. and higher), operate on diesel fuel engines. There has been an increasing amount of press coverage romancing the idea that a plethora of start-up truck companies can quickly revolutionize the industry and deploy a convoy of long-haul trucks built with EV battery technology. They have received their fair share of press coverage during their honeymoon phase.

However, these companies have so far failed to deliver on their promise because of a simple fact that EV battery technology remains elusive in its quest to accomplish the realities of balancing battery weight, necessary vehicle range, and payload requirements especially for over-the-road Class 8 equipment.

World-renowned research firm analysts believe the realities are not a few years away for long-haul trucks, but more likely decades. As one example, they point toward truck makers touting vehicle ranges of 200 miles, but the daily driving realities show these trucks travel double or even triple that on a daily work schedule.

According to Wood Mackenzie analysts: Despite all the activity, Wood Mackenzie analysts do not expect electric heavy-duty trucks to take a large share of the market within the next couple of decades. In our base case forecast, electric trucks will displace about 700,000 barrels a day of oil demand in 2040, about 0.6% of world consumption. The majority of that impact comes from light to medium trucks, mostly driving short distances where battery range is not a concern[4].

In a recent industry survey[5], more than half of fleet respondents (54%) said they may consider electric class-8 trucks for over-the-road between 5-10 years from now, and only 3% of fleet executives are currently procuring electric trucks today. A year ago, 30% of respondents said they did not see electric trucks widely in service for another ten years.

It's not just analysts who are hesitant, but fleet executives remain unconvinced as well. Most companies with transportation fleets continue to believe clean-diesel technology and new low carbon fuel remain more viable for emissions reduction than a move to EV battery or hydrogen fuel cell. Furthermore, a recent report from the American Transportation Research Institute (ATRI) acknowledged proposed mandates that would require all trucks sold in California to be zero emission by 2040, but because this would require significant changes to freight business models, it believes '**some trucking companies will simply not be able to use today's ZET (Zero-Emission Transport) technologies as part of their operations.**'[6]

There's also a debate over how to make the transportation industry free of emissions without the use of batteries, such as a system that feeds electricity to trucks as they drive, using wires strung above or below the roadway and a pantograph or transmission source mounted on the top or underside of the cab. This technology has been documented and debated in Europe, but again the staunch economic costs make it anything but a near-term reality.

Companies that use the electrified routes would certainly save money on fuel and perhaps even justify the investment in trucks with rooftop pantographs. An estimated 4,000 kilometers of wired highway, or nearly 2,500 miles, would need to accommodate 60% of truck traffic to make it truly viable. This means the government would be tasked with building the overhead or underground cables, which cost an estimated $2.5 million euros ($2.7 US) per kilometer, or about $5 million per mile. At 2,500 miles, that's a steep price to pay[7].

THE REALITY OF TODAY'S EV BATTERY ACTIVITY

CONTINUED

The U.S. government and utility companies will also need to address aging infrastructure before implementing the right technologies to handle EV demand. America's desire to move toward EVs could be upended by aging transformers and dated electrical lines that have made it hard for homeowners, local governments, and businesses to use solar panels, batteries, electric cars, heat pumps and other devices that can help reduce greenhouse gas emissions.

Transportation industry leaders refer to this as the "well-to-wheel" comparison. Decarbonizing transport shouldn't be viewed solely as what comes out of the tailpipe; the industry and regulators must also look at emissions for how the fuel or energy was generated and eventually delivered to the truck.

For example, are battery-electric vehicles still considered 'clean' if the electricity is generated from coal-fired power plants? What's more, the hydrogen produced for fuel-cell vehicles comes from a steam-methane reforming process, a high-carbon production method resulting in what's called "gray" hydrogen. NACFE (North American Council for Freight Efficiency) has concluded that one of the largest questions for the migration to fuel-cell trucks is the source of hydrogen. **So far, it remains to be seen how all of this truly impacts the overall carbon output, as well as methods of actually financing the projects.**

As quoted in New York Times[8]:
"It would cost hundreds of billions of dollars to upgrade the distribution networks across the country to meet the country's clean energy goals, said Ben Hertz-Shargel, global head of Grid Edge, a division of Wood Mackenzie, a research and consulting firm. That does not include spending on long-distance transmission lines and power generating equipment like solar and wind farms."

THE LOGICAL APPROACH – CREATE A BRIDGE TO FUTURE ENERGY ALTERNATIVES

Companies that operate heavy-duty truck fleets continue to ponder the right strategy.

They want to do what's right for their key stakeholders – customers, employees, an environmentally-conscious public, as well as shareholders. However, the economics of electric battery technology and hydrogen are simply not a viable option today, and perhaps not for a few more decades for these types of operations.

The best approach to bridge today's clean-diesel technology into tomorrow's alternate fuel options is by leading with the right ESG strategy supported by strategic industry partners, companies with experience, and heavy-duty fleets that can meet today's need for transport infrastructure while serving as leaders to the future.

This is critical because environmental, social, and governance are values that every business is now embracing.

Key to these companies and their fleets is appropriately managing their Total Cost of Ownership (TCO) through accurate truck Life Cycle Cost Management (LCCM).

By shortening asset life cycles, optimizing vehicle specification to be more fuel-efficient, and aligning with the duty cycle as well as geographical locale, analytics-driven business intelligence is driving better truck asset management decisions to execute on the environmental criteria through a continuous reduction in emissions, fuel consumption, and waste oil.

THE LOGICAL APPROACH – CREATE A BRIDGE TO FUTURE ENERGY ALTERNATIVES

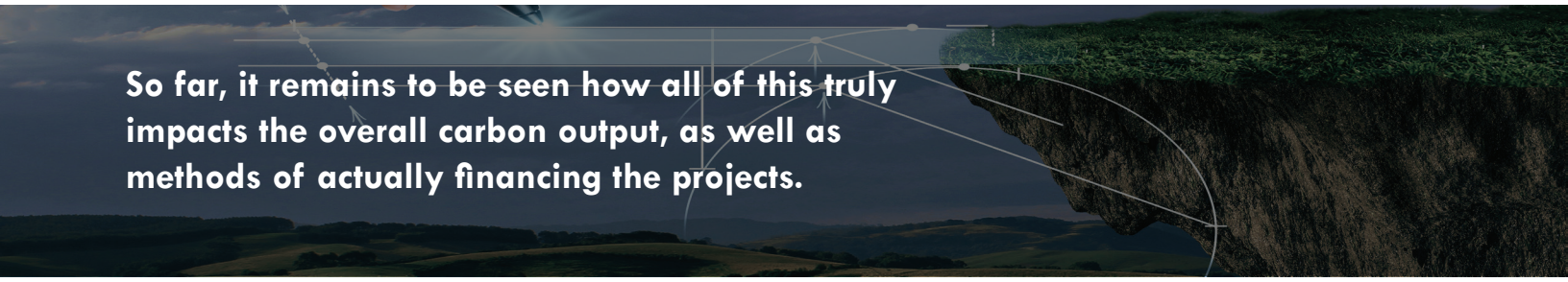
CONTINUED

The average driving MPG for a 500-unit fleet operating a 5-year life cycle is 8.41. The average MPG for an 8-year life cycle is 7.90. If organizations switch from an 8-year life cycle to a 5-year life cycle, they will net a total fuel reduction in gallons of 2,494,770. This is not a difficult task and its impact over 5-10 years would be significant, producing a potent reduction in CO2 of 25,122 metric tons and 6.1%.

These strategies recently helped two top-100 fleet organizations eliminate over 55,000 metric tons of CO2 while conserving over 5 million gallons of fuel. **At $5.12 per gallon of diesel, that equates to improved MPG and over $25 million in reduced fuel expenditures!**

Companies that support their social criteria by operating newer and safer trucks, help save all motorist lives and attract and retain a greater pool of diverse drivers and support staff while mitigating litigation and reducing GHG emissions.

Lastly, fleets continue to rely on their industry partners throughout this bridge strategy to address governance, where analytic processes and transparency help organizations meet legal requirements and satisfy every stakeholder in the process.



STATUS OF TODAY'S FUEL ALTERNATIVES

There continues to be a growing number of conversations in the news about a number of fuel alternatives for cars and trucks. Each alternate fuel technology has its benefits and promises, but also challenges and obstacles for everyday use. In the following sections, we will review the technologies as well as their pros and cons as it relates to Class 8 vehicles.

ELECTRIC BATTERY TECHNOLOGY

WHAT IS IT: An electric-vehicle battery (EVB, also known as a traction battery) is a battery used to power the electric motors of a battery electric vehicle (BEV) or hybrid electric vehicle (HEV). These batteries are usually rechargeable (secondary) batteries and are typically lithium-ion batteries. These batteries are specifically designed for a high ampere-hour (or kilowatt-hour) capacity.

PROS

- Better corporate image - the first purchase will garner big headlines, but there is a risk if you do not go "Green" enough
- Driver Retention - smooth operation, updated safety technology, updated driver comforts
- Reduction of noise pollution - quiet operation, less vibration
- Regenerative Braking - smooth one pedal operation, utilizing momentum to charge batteries, gradual stop
- Launch with instant torque - no waiting for RPM before max torque kicks in and no loss of power or torque on hills
- Portable power supply
  - Possibility for exportable power
  - Ford E-Transit will offer 2.4kW of power for power tools

STATUS OF TODAY'S FUEL ALTERNATIVES CONTINUED

ELECTRIC BATTERY TECHNOLOGY

CONS

- Repurposing, recycling, and disposal - EV batteries are engineered to last seven to ten years
  - BEV's Lithium-Ion battery production emits more than six times the CO2 as an ICE truck[6]
  - Highly toxic sludge after recycling is completed
  - Once an EV battery reaches 80% degradation, it is no longer suitable for powertrain use
  - 80% charge equals 50% power (about half its maximum life) – less amps/kw, signaling a repair is needed that is covered by warranty
- Range – Class 8
  - Peterbilt 579EV 80k GCWR-150-mile range
  - FL eCascadia and Kenworth T680E 82k GCWR up to 250-mile range
  - Current trucks are being billed as regional haulers
  - Range hinge on duty cycles and pay loads
  - Other range reducing considerations - ambient temperature, weather, operating region/area, terrain
- Battery Fires
  - Lithium-ion battery fires are dangerous - the burning lithium creates a metal fire existing at temperatures of 2,000 degrees Celsius/3632 degrees Fahrenheit
  - Attempting to douse the fire with water could lead to a hydrogen gas explosion!
  - Special training required to disconnect and/or disable
- Plan "B" when the lights go out
  - Project management cost
  - Can your utility electric provider support this additional energy usage?
  - Can you project your needs for 10 years as the technology evolves?
  - Will utility companies maintain the demand?
- Dig deep to go "Green"
  - Class 1-2 E-Transit MSRP $43,295 - Gas Powered $38,125 2022 Ford Transit 350
  - Lordstown Pickup $55,000 - Gas Powered $26,000 (similar to Chevy Colorado or Ford Ranger)
  - Price rises when larger battery packs are optioned
  - Non-residential DC fast chargers range from $10,000-$40,000
- Battery Sourcing
  - Takes almost twice the raw materials to produce a battery for a class 8 vehicle than other vehicles
  - Used OEM batteries – only - Cost
  - Non-OEM batteries are not reliable and will cause problems even though they are cheaper
  - Fast charging not ideal - Cost =$10,000 to $40,000 per charger
- Do you have all the power you need?
  - Rolling power outages create concerns for EV charging stations
  - Back-up diesel or natural gas generators would need to be of significant size and are self-defeating
  - Cost of back-up generators for EV chargers start around $50k each
- Tools and Training (EV training for the technicians)
  - Special clothing, gloves and arc-resistant gear will be needed when servicing or repairing

The total carbon dioxide emissions created through the production of a battery-electric vehicle is far higher than those produced during production of a fuel-cell-electric vehicle (24% of a battery-electric vehicle's carbon dioxide emissions) or of an internal combustion engine vehicle (nearly 16% of a battery-electric vehicle's carbon dioxide emissions)[9].

STATUS OF TODAY'S FUEL ALTERNATIVES CONTINUED

HYDROGEN FUEL CELL

WHAT IS IT: A hydrogen fuel cell is an electrochemical power generator that combines hydrogen and oxygen to produce electricity, with water and heat as by-products. Zero Emissions hydrogen is classified as Green. Near Zero Emissions hydrogen is classified as Blue.

PROS

- Zero-emission power
- Improved engine efficiency
- Green or Blue hydrogen readily available
- Hydrogen tanks can be refilled
- Tractor tare weight is critical to maximizing payload
- Routes over 500 miles are common
- Incentives for using hydrogen are available where you operate

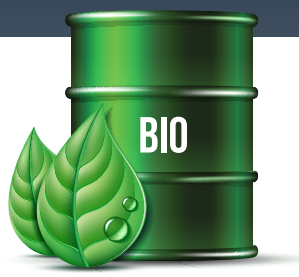
CONS

- Variety of ways to produce hydrogen are fueling competition and innovation to produce cheaper/cleaner hydrogen but the transportation industry alone cannot support it
- Current hydrogen production method is far from zero emissions as it produces CO2 and methane but the cheapest to produce is classified as Gray
- The fuel cells only have about a 5-year life span before needing to be rebuilt. They were claimed to have a 7-year span but that was inaccurate
- Rebuild cost was about $3,000 to $5,000
- Winter conditions are significant to operations - very susceptible to failure in temps. below -10 degrees
- Currently there are only handful of hydrogen filling stations in Europe and less in the U.S.
- Demand will need to be driven by customers
- Less mountainous regions / weight of hydrogen system can affect total vehicle[10]

COMPARISON			
	H2FCEV (Hydrogen)	BEV (Electric)	Diesel
Tare Weight	18,000 to 20,000lbs	22,000 to 24,000lbs	15,000 to 19,000lbs
Pay Load Capacity	56,000 to 58,000lbs	53,000 to 55,000lbs	61,000 to 65,000lbs
Fill/Charge Times	10 to 15 minutes	Up to Several Hours	10 to 15 minutes

Producing hydrogen now is such an energy-intensive process that it cancels out any climate benefits from a zero-emission vehicle, analysts say. The use of hydrogen fuel cells in the biggest semi tractor-trailer trucks will lag behind battery-electric trucks for up to a decade, says Greg Genette, senior research analyst in the U.S. commercial vehicle group at IHS Markit[11]. However, transportation futurist Gary Golden argues that BEVs could have their day, but if the industry's focus is on decarbonization, fuel cells are trucking's future, citing lack of charging infrastructure and battery materials, which are only found in a few countries. That's an argument also backed by ATRI and Tier 1 suppliers[12].

BIODIESEL / RENEWABLE DIESEL



WHAT IS IT: Fuels that are made from animal fats, used oils, and plants.

PROS

- Biodiesel – Burns cleaner than Renewable diesel due to the O2 content
- Renewable Diesel – Will not freeze or separate due to lack of O2 content

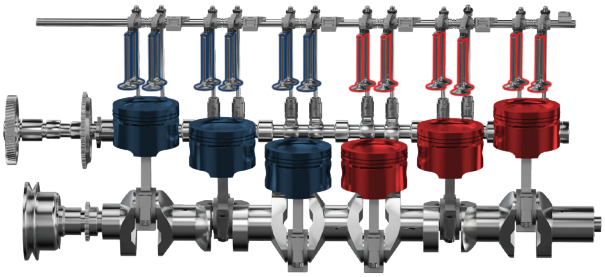
CONS

- Must be mixed with conventional or renewable diesel
- Temperature sensitive - Fatty Acid Methyl Ester (FAME) biodiesel solidifies at relatively high temperatures. Biodiesel Cloud Points (degrees C): Canola -3 Soy +2 Palm/Tallow +15[13]
- Logistics make specialty diesel geographically isolated
- Diesel additives exist but "move the needle" very little
- Renewable Diesel – cost and limited availability currently
  - Lower density - less power per volume
  - Low lubricity - impact on lubrication for moving parts like the fuel pump
  - Reports on degradation of fuel pump O-rings on older model generators

STATUS OF TODAY'S FUEL ALTERNATIVES CONTINUED

CYLINDER DEACTIVATION

WHAT IS IT: A technique in multi-cylinder engines where a combination of cylinders are systematically disabled using the latest chip technology, reducing the engine's displacement, improving overall engine efficiency, and reducing fuel economy and emissions. CDA is achieved by deactivating the intake and exhaust valves for the deactivated cylinder. This can be done on multiple cylinders of an engine providing variations of active cylinder displacement.



PROS

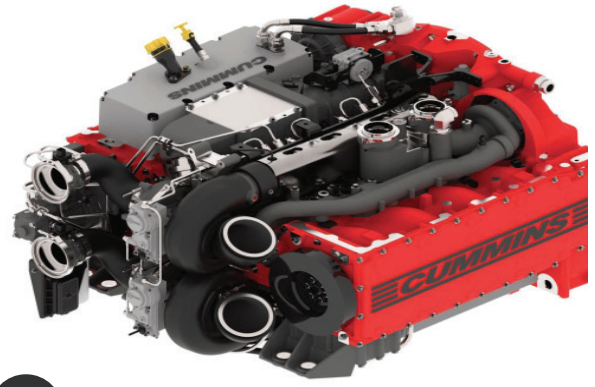
- Works on gasoline engines very well
- Cummins/Tula - X15 Using DSF diesel Dynamic Skip Fire Technology
- Shuts down 2 of 6 cylinders
- Reported cut of 74% in NOx
- Dropping CO2 by 5% - 20%
- Increase fuel efficiency by up to 20%
- Mass production... 2024 to 2025

CONS

- Still working through the intricacies on diesel engines
- Requires change to internal components
- Similar technology on gasoline engines has increased the complexity of the valve train
- Training for technicians

OPPOSED PISTON DIESEL ENGINES

WHAT IS IT: An opposed-piston engine is a piston engine in which each cylinder has a piston at both ends, and no cylinder head. The pistons move toward one another and (almost) meet at top dead center. As the pistons get closest to each other (or maybe just before) at the top of each stroke, diesel fuel is injected into the cylinder and combustion occurs. Diesel opposed-piston engines have been used mostly in large-scale applications such as ships, military tanks, and factories. Current manufacturers of opposed-piston engines include Fairbanks-Morse, Cummins[14].



PROS

- Efficiency improvements - 30% to 50%
- Lower maintenance costs
  - No valve train and head
  - Fewer moving parts
  - Cooler operating temperature
- Lower emissions
  - Fuel is injected from the side and not the top
  - Two pistons firing off the same injection
  - Reduced friction
  - Higher exhaust temp results in lower NOX
- Better fuel economy
- Lighter

CONS

- Wide platform
- Two stroke engine - with the increased number of ignition strokes it has historically been louder
- Negative reputation - some remember two-stroke engines to have performed poorly
- Need to run two crank shafts
- Limited knowledge in repair and maintenance
- Excess oil consumption - a turbo is needed to keep constant pressure to reduce oil blow by. Older units without a turbo would burn a quart of oil every few days

THE BENEFITS OF CLEAN DIESEL TECHNOLOGY

Forward-thinking fleets utilizing flexible leasing solutions emphasizing shorter life cycles will be well-positioned to take advantage of newer, clean diesel technologies as it becomes available. Today, many fleets use this principle of innovation as a foundation to encourage philosophical change within the transportation industry.

The diesel industry has made great strides toward a more environmentally friendly impact on the global carbon footprint.

Thanks to the development of cleaner fuels, newer engine technology, and particulate filters, both PM (particulate matter, aka soot) and NOx (nitrogen oxides) emissions have dropped by 98% since 1988.

Diesel-related NOx emissions dropped by more than 40% between 2007 and 2017, while fine particle emissions (PM 2.5) from diesel engines declined by over 230,000 tons between 2008 and 2017, according to the Diesel Technology Forum[15]. Additionally, from 2005 to 2018, total U.S. energy-related CO2 emissions fell by 12%[16].

Clean diesel technology also helps to support overall sustainability measures, which cut across all aspects of a business, from energy consumption to procurement. Corporate fleets, along with their strategic partners, are illustrating how important it is to invest in educating employees about sustainability and create systems and processes that make it easier for employees to integrate clean diesel-forward sustainability into their business decisions. Many of these initiatives require specialized knowledge, such as talking to suppliers about sustainable sourcing or using eco-efficiency resources to evaluate a new product.

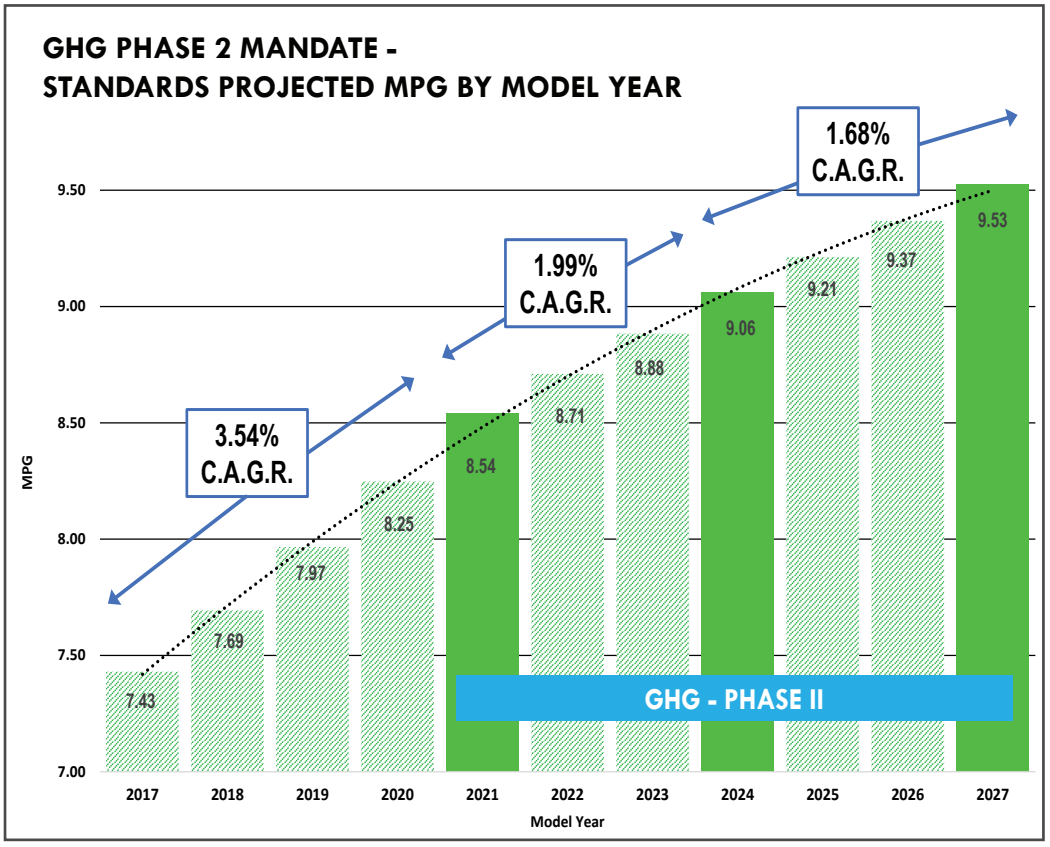
The Diesel Technology Forum recently illustrated that 49% of all diesel-powered commercial vehicles on the road today are now powered by clean-diesel engine technology. This is important because the EPA has plans to make even stricter environmental regulations on heavy-duty Class-8 trucks.

New greenhouse gas/fuel efficiency regulations, GHG Phase II, call for improvements that will ratchet down CO2 emissions by an additional 24% by 2027 (compared to Phase I).

This will require a continued emphasis on replacing older trucks with the most advanced new engine technology, aerodynamic design, lower-rolling-resistance tires, extended idle reduction technologies, and of course, engine, transmission, and driveline improvements[17].

On the right is a summary illustrating the mandate utilizing Fleet Advantage's billions of miles of data as it relates to MPGs and Compound Annual Growth Rate (CAGR) percentage of improvement.

The overall CAGR projection from 2017MY to 2027MY is 2.52%. The CAGR for the 10-year average MPG (2012-2022) is approximately 1.67%.



THE BENEFITS OF CLEAN DIESEL TECHNOLOGY
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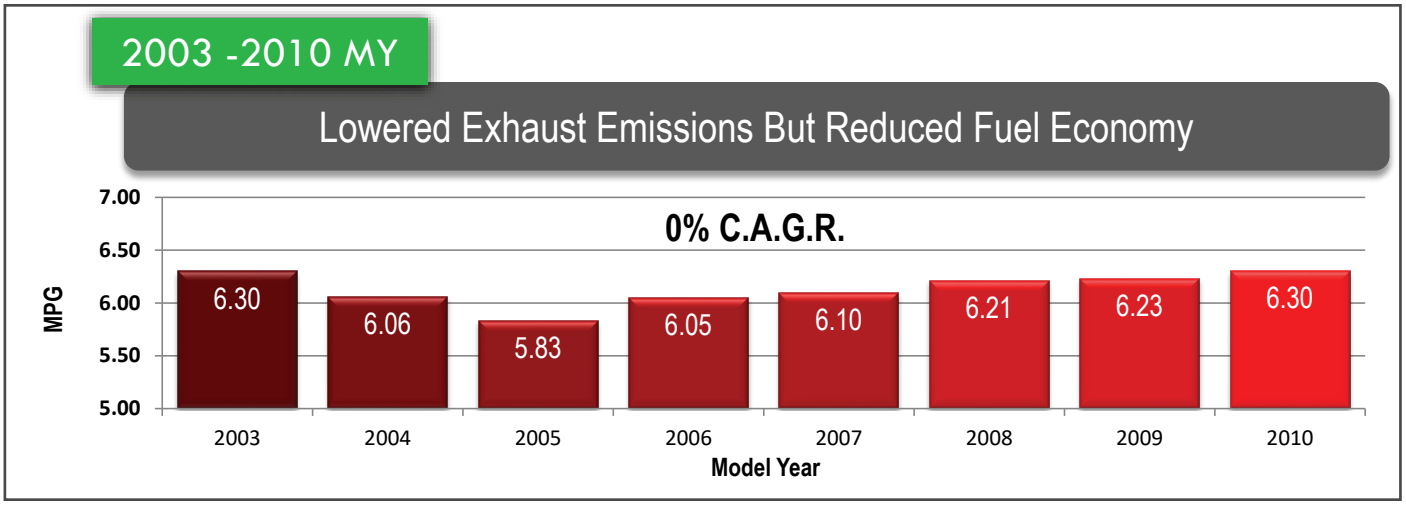
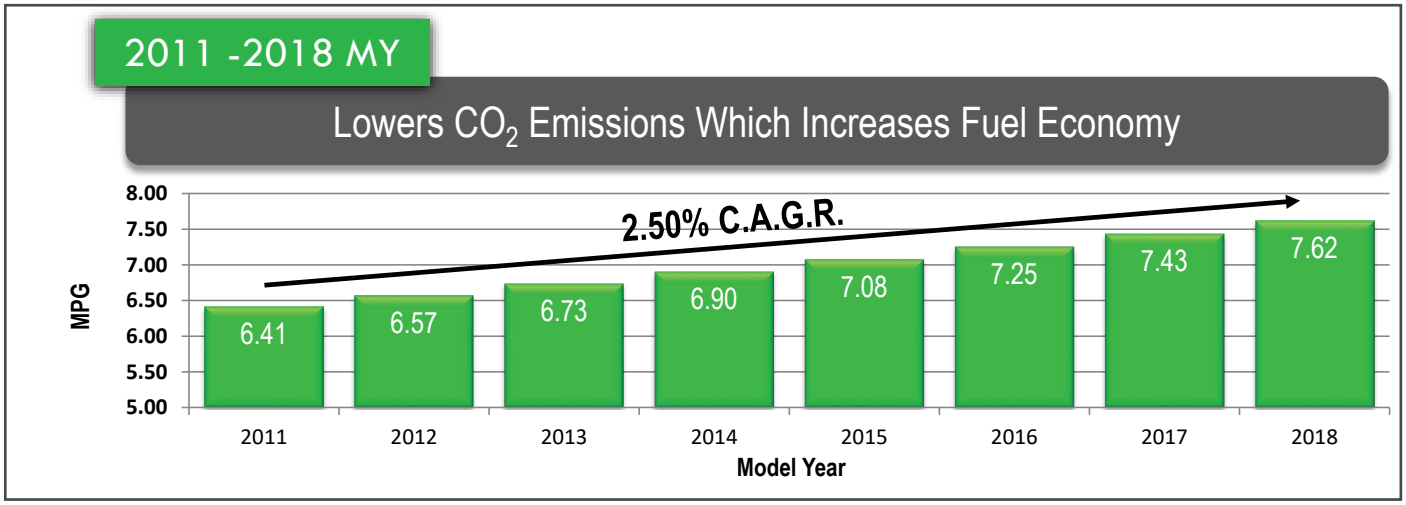
Illustrated below is historical tracking based on Fleet Advantage's database:





Life cycle cost management solutions are helping fleet organizations maximize the potential of clean diesel to reach their ESG goals while promoting sustainability through a continuous reduction in emissions and fuel consumption.

Tailored solutions also specify lighter components on equipment that allow for longer maintenance intervals, reducing environmental hazmat waste disposal.

Fleet organizations need to continue working with strategic asset management partners on innovative ways to upgrade their older-model trucks into clean-diesel technology.

The industry has relied on companies with a pioneering mindset to introduce new programs that make it possible for companies to upgrade and structure new programs with flexibility in mind so that the necessary investments aren't detrimental to the financial operations.

A GLIMPSE AT THE FUTURE OF ALTERNATE FUEL TECHNOLOGY

It is clear that alternate fuels and technologies will eventually replace fossil fuel-based energy for all transportation and power generation modes. Our current level of dependence on fossil fuels will result in the eventual and rapid depletion of these finite materials in the future. A pathway toward alternate fuels is critical since we risk the reality of running out of these precious, non-renewable resources in the future. That means no more oil, natural gas, or even coal.

This future will arrive at different intervals for various vehicles, from light cars and trucks to medium- and heavy-duty trucks that carry goods over our nation's highways. Governments, alternate fuel developers, municipalities, and utilities need to work together to roll out the right implementation strategy that keeps everyone's interests in mind. It is also critical to exercise responsible fiscal policy to reach these goals without bankrupting an entire global economy.

While many voices within the industry debate the actual timing of this future, virtually everyone agrees it won't be in the next few years for a variety of reasons. This was recently a topic of discussion at the ACT Expo Fireside Chat, where Patrick Carré, VP of Shell's Commercial Road Transport Sector, shared his thoughts[17].

> "There are a few things from a regulatory point of view and framework that need to happen to accelerate. What I mean by that is if negative CO2 emissions aren't factored into the pricing, technology change will not happen. If you think about the situation today, there are many advantages that diesel technology brings. If the CO2 effect of diesel consumption doesn't get factored into the price, it will be very difficult for other technologies to emerge. That is a role the regulators should play."

CONCLUSION: FIND A PARTNER THAT CAN PROVIDE AN ACTIONABLE PLAN FOR "A BRIDGE TO CLEAN ENERGY"

A NATURAL BRIDGE PROGRESSION STRATEGY IS NECESSARY FOR ACHIEVING THE GOAL OF CONTINUOUS IMPROVEMENT TO A SUSTAINABLE GLOBAL EMISSIONS REDUCTION

Fleets must find the right strategic asset management partners to collaborate on truck procurement strategies that identify optimal life cycle management practices to maximize environmental considerations and progress toward alternate fuel technology tomorrow.

In doing so, fleets will achieve critical ESG goals and continuously operate the most appropriate equipment for their operation. This will provide many benefits, including reduced emissions, improved safety records, and driver retention objectives while lowering maintenance expenditures and their Total Cost of Ownership.

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ABOUT FLEET ADVANTAGE

Fleet Advantage is the largest independent lessor for heavy-duty Class-8 trucks and has over $1.8 Billion of assets under its Life Cycle Cost Management (LCCM) program. We serve America's top corporate fleets, including 5 of the top 10 private fleets in the country. Fleet Advantage guarantees the absolute lowest cost of operation by providing fleet asset management, financing solutions, and fleet analytics, using the latest equipment technology to achieve optimum vehicle productivity and maximum safety. Our model of TCO, clean diesel, and safety-enhanced trucks with shorter life cycles complement our customers' ESG goals.

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PIONEER SPOTLIGHT - JOHN FLYNN

INNOVATOR IN ENVIRONMENTAL STEWARDSHIP FOR FLEETS

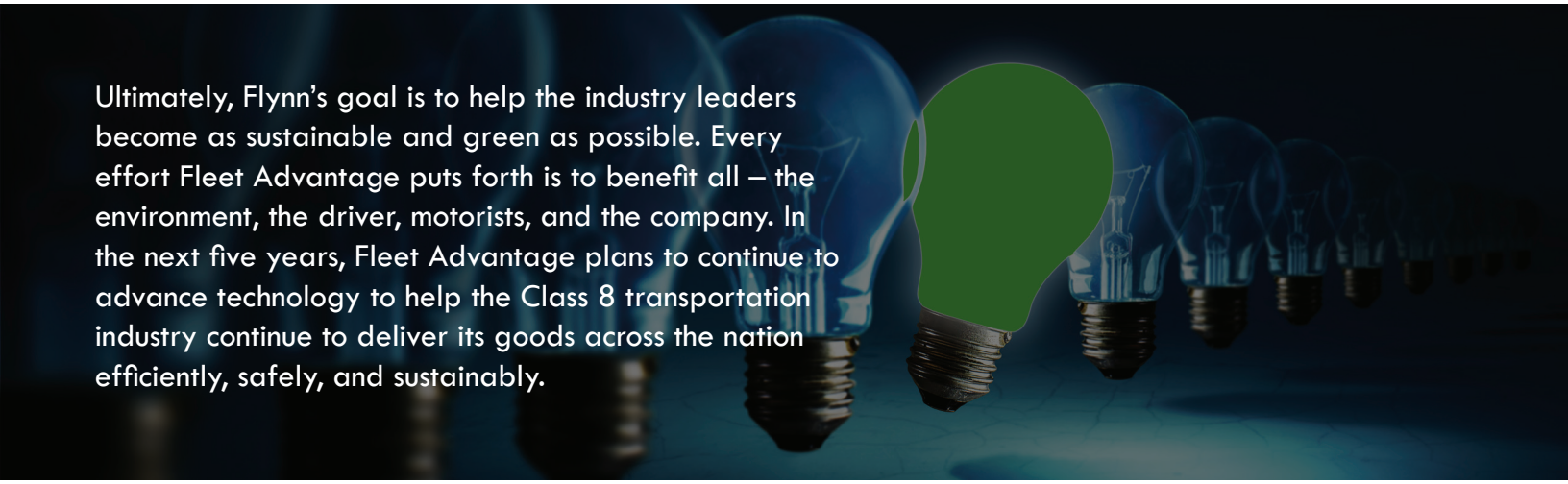
Entering the new millennium, few companies across all industries had a watchful eye toward environmental stewardship, particularly throughout the heavy-duty truck transportation industries. However, just a few short years later, governments in many countries began to better understand the benefits that could come from corporations curbing their carbon emissions output, and new greenhouse gas mandates began to take effect by the early 2000s.

Mr. Flynn was a successful fleet transportation executive who pioneered data analytics to help fleets run their operations more efficiently. He retired in the early 2000s after selling his company, but his retirement did not last long. With a family relative receiving treatment for cancer caused by environmental pollutants, Flynn realized the importance of starting a new company that could help companies comply with the latest environmental regulations and serve as model corporations regarding environmental stewardship.

Flynn founded Fleet Advantage in 2008 with the goal of being the future of truck leasing by advocating solutions that would significantly reduce emissions over time. By 2011 Fleet Advantage had begun to make strong recommendations against the use of older-model equipment because of toxic emissions. The company introduced never-seen-before emissions scorecards and a pioneering replacement program with financial flexibility in mind that made it beneficial to operate newer clean-diesel engines. This program also helped fleets meet new GHG-1 Federal mandate standards and calculated fuel economy gains at 2.5% MPG and CO2 reductions.

Flynn's leadership and focus on environmental preservation was a wake-up call to many organizations. Fleet Advantage had secured long-term agreements with ten of America's Top 100 Private Fleets in just seven years. Flynn continued his mission to help fleets change the way they see the environment, as well as their impact and expanded its technologies, data analytics and asset management – ATLAAS (Advanced Truck Lifecycle Administrative Analytics Software), which identifies the TIPPINGPOINT®, the point where it costs more to maintain and fuel an existing vehicle than it does to replace it with a new, more fuel-efficient model.

Today, companies engaged with this leadership boast vastly improved environmental records while implementing ESG strategies in front of customers, regulators, and other critical stakeholders. In total, Fleet Advantage has saved customers approximately $250 million and approximately 175,000 metric tons in emissions since inception.



Ultimately, Flynn's goal is to help the industry leaders become as sustainable and green as possible. Every effort Fleet Advantage puts forth is to benefit all – the environment, the driver, motorists, and the company. In the next five years, Fleet Advantage plans to continue to advance technology to help the Class 8 transportation industry continue to deliver its goods across the nation efficiently, safely, and sustainably.